

KENTUCKY'S Innovation Ecosystem

Changes in our economy and our society are redefining how we create economic opportunity and build successful enterprises. These changes are compelling critical examinations of how we pursue economic development in Kentucky. Given the importance of young high-growth firms for wage and job growth, it is vital for states, regions, communities, and universities to effectively leverage their assets toward the development of entrepreneurs, creation of startups, and sustaining high-growth enterprises.



Infographic by The Center for Business and Economic Research & The Innovation Network for Entrepreneurial Thinking

Five Ingredients that Fuel Innovation and Entrepreneurship



Ideas



Money



Skilled Workforce



Community & Political Support



Infrastructure

HOW DOES KENTUCKY'S INNOVATION ECOSYSTEM STACK UP TO THE U.S. AND COMPETITOR STATES?

THE COMPETITOR STATES

Kentucky competes globally, but these 12 states are viewed as key competitors for talent, investments, and industrial recruitment.

Alabama, Georgia, Illinois, Indiana, Mississippi, Missouri, North Carolina, Ohio, South Carolina, Tennessee, Virginia, & West Virginia

24%

KENTUCKY ADULTS WITH A BA/BS DEGREE OR HIGHER

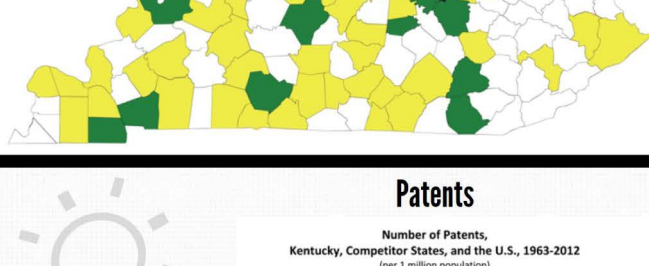
Education is the key for creating a competitive economy, especially one built on innovation and entrepreneurship. Among adults 25 to 64 years old, Kentucky lags the competitor states and the nation in educational attainment at the college level—23.5 percent for Kentucky compared to 29 and 30.6 percent for the competitor states and the U.S., respectively.

Kentucky ranks 45th on the 2012 Milken Institute State Technology and Science Index

The Innovation in American Region Tool shows that Kentucky's innovation hot spots are within the so-called urban triangle.

County Innovation Index Value

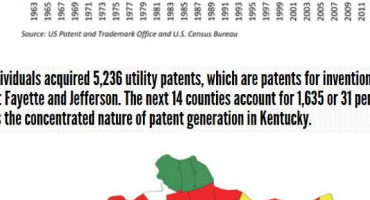
61 to 70
70 to 79
79 to 85
85 to 97



Source: Milken Institute Science and Technology Index, 2012

Patents

Number of Patents, Kentucky, Competitor States, and the U.S., 1963-2012 (per 1 million population)

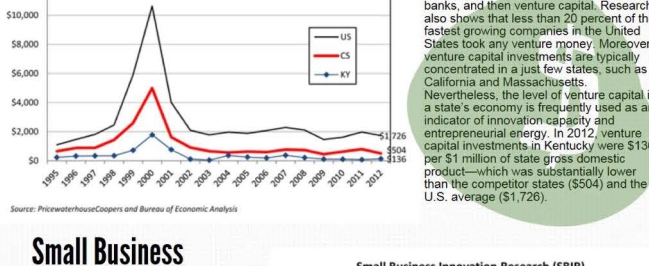


Source: US Patent and Trademark Office and U.S. Census Bureau

From 2000 to 2011 Kentucky businesses and individuals acquired 5,236 utility patents, which are patents for invention. Of this total, 2,771 or 53 percent were from two counties: Fayette and Jefferson. The next 14 counties account for 1,635 or 31 percent. The county-level map illustrates the concentrated nature of patent generation in Kentucky.

Number of Patents

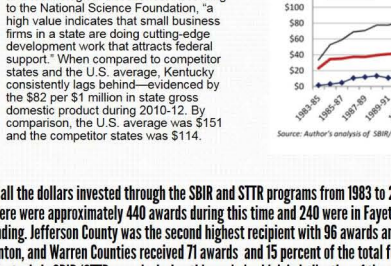
None
1 to 11
11 to 50
51 to 250
1,000 to 1,700



Click here for an interactive map.

Venture Capital

Venture Capital Investments, Kentucky, Competitor States, and the U.S., 1995-2012 (Current dollars, per \$1 million/state GDP)



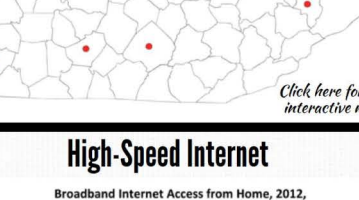
Source: PricewaterhouseCoopers and Bureau of Economic Analysis

According to the Kauffman Foundation, most young companies are started from the savings of their founders and then sustained by positive cash flow. The next largest source of capital for young companies is credit cards, followed by borrowed money from family and friends, banks, and then venture capital. Research also shows that less than 20 percent of the fastest growing companies in the United States took any venture money. Moreover, venture capital investments are typically concentrated in a just few states, such as California and Massachusetts. Nevertheless, the level of venture capital in a state's economy is frequently used as an indicator of innovation capacity and entrepreneurial energy. In 2012, venture capital investments in Kentucky were \$136 per \$1 million of state gross domestic product—which was substantially lower than the competitor states (\$504) and the U.S. average (\$1,726).

Small Business Innovation Research

Small Business Innovation Research (SBIR) and Technology Transfer (STTR) funding is available to companies with 500 or fewer employees; it is designed to stimulate high-technology innovation and facilitate the commercialization of scientific and technological discoveries. According to the National Science Foundation, "a high value indicates that small business firms in a state are doing cutting-edge development work that attracts federal support." When compared to competitor states and the U.S. average, Kentucky consistently lags behind—evidenced by the \$82 per \$1 million in state gross domestic product during 2010-12. By comparison, the U.S. average was \$151 and the competitor states was \$114.

Small Business Innovation Research (SBIR) & Technology Transfer (STTR) Funding, 1983-2012, Kentucky, Competitor States, and the U.S. (SBIR/STTR funding/\$1 million GDP)

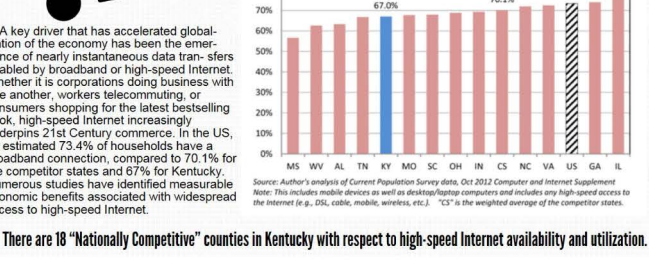


Source: Author's analysis of SBIR/STTR data

Of all the dollars invested through the SBIR and STTR programs from 1983 to 2012, the majority went to ventures in two counties. There were approximately 440 awards during this time and 240 were in Fayette County, which represents 43 percent of the total funding. Jefferson County was the second highest recipient with 96 awards and around 35 percent of the total funding. Woodford, Kenton, and Warren Counties received 71 awards and 15 percent of the total funds. These five counties account for virtually all of Kentucky's SBIR/STTR awards during this period, which is indicative of the geographic concentration of Kentucky's innovation ecosystem.

Number of Awards

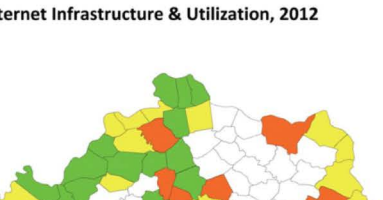
1 to 10
15 to 30
96
241



Click here for an interactive map.

High-Speed Internet

Broadband Internet Access from Home, 2012, Kentucky, Competitor States and the U.S. (percent of households)



Note: This includes mobile devices as well as desktop/laptop computers and includes any high-speed access to the Internet (e.g., DSL, cable, mobile, wireless, etc.). "CS" is the weighted average of the competitor states.

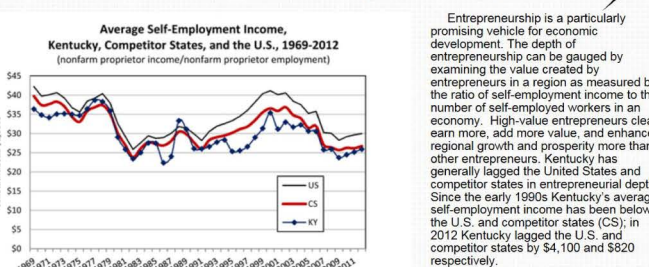
A key driver that has accelerated globalization of the economy has been the emergence of nearly instantaneous data transfers enabled by broadband or high-speed Internet. Whether it is corporations doing business with one another, workers telecommuting, or consumers shopping for the latest bestselling book, high-speed Internet increasingly underpins 21st Century commerce. In the US, an estimated 73.4% of households have a broadband connection, compared to 70.1% for the competitor states and 67% for Kentucky. Numerous studies have identified measurable economic benefits associated with widespread access to high-speed Internet.

There are 18 "Nationally Competitive" counties in Kentucky with respect to high-speed Internet availability and utilization.

Estimated High-Speed Internet Infrastructure & Utilization, 2012

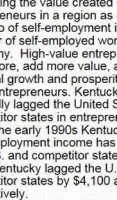
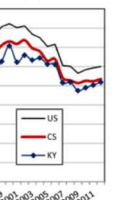
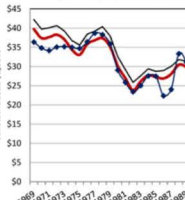
Categories

Info Highway Slow Lane
Frustrated Surfers
On the Cusp
Nationally Competitive



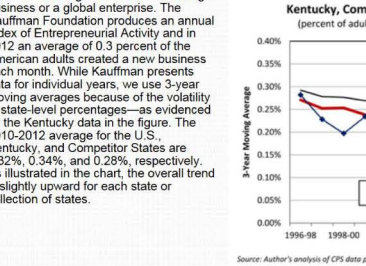
Click here for an interactive map.

Are the five key ingredients being translated into entrepreneurial outcomes?



Entrepreneurial Depth

Average Self-Employment Income, Kentucky, Competitor States, and the U.S., 1969-2012 (nonfarm proprietor income/nonfarm proprietor employment)

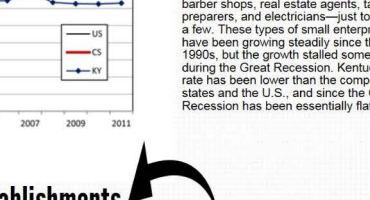


Source: U.S. Department of Commerce, Bureau of Economic Analysis

Entrepreneurship is a particularly promising vehicle for economic development. The depth of entrepreneurship can be gauged by examining the value created by entrepreneurs in a region as measured by the ratio of self-employment income to the number of self-employed workers in an economy. High-value entrepreneurs clearly earn more, add more value, and enhance regional growth and prosperity more than other entrepreneurs. Kentucky has generally lagged the United States and competitor states in entrepreneurial depth. Since the early 1990s Kentucky's average self-employment income has been below the U.S. and competitor states (CS); in 2012 Kentucky lagged the U.S. and competitor states by \$4,100 and \$820 respectively.

Entrepreneurial Breadth

Individuals Creating New Businesses, Kentucky, Competitor States, and the U.S., 1996-2012 (percent of adults 20-64 creating a new business each month)



Source: Author's analysis of CPS data provided by Robert W. Fairlie, Kauffman Index of Entrepreneurial Activity

Nonemployer Establishments

Nonemployer Establishments, Kentucky, Competitor States, and the U.S., 1997-2011 (per 1 million noninstitutionalized civilian population)

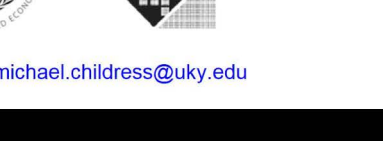


Source: Author's analysis of data from the U.S. Census Bureau

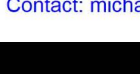
This is a measure of self-employment. According to the Census Bureau, "A nonemployer business is one that has no paid employees, has annual business receipts of \$1,000 or more (\$1 or more in the Construction industry), and is subject to federal income taxes." Some examples of these businesses are beauty salons, child-care providers, landscaping services, barber shops, real estate agents, tax preparers, and electricians—just to name a few. These types of small enterprises have been growing steadily since the late 1990s, but the growth stalled somewhat during the Great Recession. Kentucky's rate has been lower than the competitor states and the U.S., and since the Great Recession has been essentially flat.

High-Tech Establishments

High-Technology Establishments, Kentucky, Competitor States, and the U.S., 2003-2011 (as a percent of total establishments)



Source: Author's analysis of County Business Patterns, U.S. Census Bureau, various years



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